

23.0 Cumulative Impacts

23.1 Introduction

The California Environment Quality Act (CEQA), Section 15355 of the CEQA Guidelines, provides some general guidelines for the assessment of cumulative impacts, as follow:

"Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. (a) The individual effects may be changes resulting from a single project or a number of separate projects. (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probably future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

This cumulative impact assessment utilizes the data generated by the environmental studies conducted for this EIR/EIS combined with: 1) existing data concerning the environmental resources of the Sacramento/San Joaquin River Delta; and 2) existing information concerning the environmental effects of other proposed projects that are known to potentially have adverse effects on the same resources affected by ISDP. The assessment first presents summaries of the proposed or potential projects identified through agency consultation and discussions with persons knowledgeable about water development within California. These summaries focus upon the findings of the available environmental documents, as readily accessible sources of generally comparable data. Several of the documents have not been certified by a State or federal Lead Agency as adequate under CEQA or NEPA, and should therefore be viewed as containing preliminary findings. Nevertheless, the data provide some overall insight into the general water development and resource impact trends in the vicinity of ISDP.

The project summaries are followed by a comparative analysis which identifies the resources that are most likely to be affected by water development projects. The comparative analysis is followed by a concluding section on overall cumulative impacts and trends.

23.2 Water-Related Project Summaries

The proposed or potential projects identified for the cumulative impacts analysis include the following federal, State, and local projects.

Auburn Dam (Reclamation)

Glenn Colusa Irrigation District Fish Facility (Reclamation)

Kesterson Reservoir Cleanup (Reclamation)

San Luis Drainage Plan (Reclamation)

Coleman Fish Hatchery (USFWS)
Upper Sacramento River Habitat Study (USFWS)
American River Watershed Investigation (Corps)
Sacramento Metropolitan Area Flood Control Study (Corps)
Los Banos Grandes Dam and Reservoir (DWR)
Monterey Agreement (DWR)
Suisun Marsh Protection Plan (portion not included in the No-Action Alternative) (DWR)
West Delta Program (portion not included in the No-Action Alternative) (DWR)
CALFED Bay-Delta Program (State and Federal Agencies)
Bay Delta Proceedings (State Water Resources Control Board)
Delta Wetlands Project (Delta Wetlands Corporation)
Los Vaqueros Project (Contra Costa Water District)

Each of these projects is described, in turn, in the following.

23.2.1 Auburn Dam (Reclamation)

The Auburn Dam and Power plant would be constructed on the American River below the confluence of the Middle and North Forks of the river. The project would provide 2.5 million acre-feet of capacity and 600,000 kilowatts of power generation capacity. Construction was authorized for the keyway and foundation in 1965. However, after the Oroville Earthquake in 1975, construction activity was stopped until a new dam was redesigned. In 1980, the Secretary of the Interior determined that the new dam design was safe, and recommended that the project be submitted to Congress for reauthorization. Congress has not taken further action. A Folsom South Area Conjunctive Use Study was initiated in 1987.

23.2.2 Glenn Colusa Irrigation District Fish Facility (Reclamation)

The effectiveness of the fish screens at the Glenn-Colusa Irrigation District (GCID) Hamilton City Pump Diversion were substantially reduced by significant hydraulic changes in the Sacramento River that lowered water depth at the screens. The low water depth decreased the effective area of the screen surfaces and increased water velocity through the screens. These changes resulted in impinging juvenile salmon and steelhead on the screens. The low water level also reduced the bypass flows, which are used to return the juvenile fish to the Sacramento River causing high predation by squawfish.

A group of federal, State, and local agencies has been conducting investigations to solve the problems. The agencies include GCID, DFG, California Reclamation Board, USFWS, NMFS, Reclamation, EPA, and the Corps. The studies have identified six alternative improvements involving different configurations of screens, fish bypass, river gradient restoration, and

pumping facilities. The project has been divided into two parts: 1) the river gradient restoration project, which is being led by the Corps, and, 2) fish screen improvements, which are being co-led by the GCID and DFG.

This project started in 1989 and a feasibility study for fish screen improvements was completed in 1990. As an interim measure, the existing screen structure was upgraded two years ago to improve performance, while the long-term solution is being developed. Negotiations for a permanent screen design are under way and a draft EIR must be completed. The tentative schedule calls for construction to begin in 1998 with completion by 2000.

A Draft Environmental Assessment for the Riverbed Gradient Restoration Project, Sacramento River - River Mile 206, California was completed in 1991. This document identified the following long-term, or post-construction, project-related impacts upon the target resources: aquatic biological resources; water quality and circulation; terrestrial rare, threatened and endangered (RTE) species; and recreational boating.

The potential project-related impacts to aquatic and terrestrial biological resources were identified, as follows: 1) could impair or completely block fish migrations during low flows (hence reducing spawning and rearing habitat) if the structures cause excessive velocities; 2) reduce spawning and/or rearing habitat for juvenile salmon (including winter-run chinook) and aquatic invertebrates (and their habitats) due to: bank armoring; removal of riparian vegetation; sedimentation; reduced gravel recruitment; and changes in channel hydrology; 3) potentially destroy bank swallow habitat; 4) disturb and partially destroy Swainson's hawk and yellow-billed cuckoo habitat; 5) potentially impact sensitive vegetation communities, including wetlands and elderberry bushes; and 6) potentially destroy Valley elderberry longhorn beetles.

The potential project-related impacts to water quality and circulation were identified, as follows: 1) increase in river elevation in vicinity of Project (extending up to 14,000 feet upstream) could potentially result in a minimal impact during flood events.

The potential project-related impact to recreational boating was identified, as follows: potentially restrict navigation and present a risk to public safety if the structure is designed inappropriately.

23.2.3 Kesterson Reservoir Cleanup (Reclamation)

The Kesterson Reservoir became the terminus of the San Luis Drain when construction of the Drain was halted because of funding limitations and disagreements over the potential environmental impacts of drainwater discharge into the Delta (the original terminus of the San Luis Drain). Selenium from the drainwater has contaminated the reservoir sediments, vegetation, and groundwater, as well as San Luis Drain sediments. Discovery of high selenium and other trace element concentrations in the San Luis Drain and Kesterson Reservoir necessitated studies to identify the source and containment/treatment methods to reduce risk of environmental damage.

In 1985, the SWRCB directed Reclamation to submit a plan to clean up the San Luis Drain and Kesterson Reservoir. A project-wide environmental impact statement was filed in 1986 for closure of the San Luis Drain and Kesterson Reservoir. Initially, the ephemeral pool areas were filled. A monitoring/evaluation program is currently underway.

The October 1986 Final Environmental Impact Statement (EIS) identified the following long-term, or post-construction, environmental effects upon the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating.

The potential project-related impacts to water quality and circulation were identified, as follows: 1) potential risk to groundwater from landfill failure if landfill is designed improperly; and 2) rising groundwater with unknown selenium concentrations would seasonally cover portions of reservoir.

The potential project-related impacts to aquatic and terrestrial biological resources were identified, as follows: 1) potential risk of contamination of new seasonal wetland vegetation; 2) loss of wetland habitat; 3) wildlife use of reservoir reduced; and 4) small risk of contamination for wildlife using reservoir.

The potential project-related impact to recreational boating was identified, as follows: potentially reduced recreational opportunities at reservoir.

23.2.4 San Luis Drainage Plan (Reclamation)

Reclamation prepared a plan to collect, treat as necessary, and dispose of 60,000 to 100,000 af of subsurface drainwater from Westlands Water District. Reclamation prepared a comprehensive plan for all five districts in the San Luis Unit: Westlands Water District, Panoche Water District, San Luis Water District, Broadview Water District, and Pacheco Water District. Reclamation completed a plan and a draft environmental impact statement (EIS) in December 1991. The study determined that, using current technology and given environmental restrictions, there is no financially feasible way to treat and dispose of 60,000 to 100,000 af of highly saline drainwater. Therefore the recommended plan included a combination of measures to reduce subsurface drainage, control releases of drainwater to the San Joaquin River, and continue development of potential treatment technologies. The plan includes: a land retirement program to remove about 57,000 acres of drainage affected land from production; a program to market up to 220,000 af of water from the drainage affected area, encouraging voluntary land retirement, conservation, and groundwater pumping to lower water tables; facilities to control the quantity and timing of drainwater releases to the San Joaquin River; and continued research and development of agroforestry and other drainage treatment and disposal technologies.

The plan was successfully challenged by Westlands Water District as not meeting the requirements of the court judgment. As of October 1992, the EIS had not been finalized and the plan had not been adopted, although negotiations continue regarding possibly implementing certain portions of the plan.

The 1991 Draft EIS identified the following long-term, or post-construction, project-related environmental effects upon the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating.

The majority of impacts would occur within the immediate project area 30 miles west of Fresno, although some impacts could extend to Delta resources.

The potential project-related impacts to water quality and circulation were identified, as follows:

- 1) small percentage reduction in flow in the San Joaquin River except during dry years when flows would decrease by approximately ten percent (presumably downstream from the confluence with the Merced River between Newman and Vernalis--not specified in document);
- 2) contribute to contaminant load passed down the San Joaquin River to Delta (an increase relative to the no action alternative, decrease relative to existing conditions);
- 3) reduction of flow in Salt and Mud sloughs; and
- 4) possible increase in water imports in the future.

The potential project-related impacts to aquatic and terrestrial biological resources were identified, as follows: 1) impacts to fish (including San Joaquin chinook salmon) and fish habitat are unknown (unclear whether improved water quality would balance the effects from reduced flows); 2) approximately 890 acres of land supporting wildlife lost to project features (including sixty acres of wildlife habitat in the Kesterson National Wildlife Refuge due to construction of the San Luis Drain extension) and 56,500 acres impacted by alternative land uses, cropland abandonment, or conversion; 3) potential impact on wildlife from use of regulating reservoirs and evaporation ponds (selenium bioaccumulation); and 4) federally listed T/E and candidate species which may be negatively impacted even with conservation measures include: winter-run chinook salmon, Sacramento splittail, and Delta smelt.

23.2.5 Coleman National Fish Hatchery (USFWS)

Coleman National Fish Hatchery (NFH) was constructed in 1942 as part of the mitigation measures to preserve significant runs of chinook salmon affected by construction of Shasta Dam. This hatchery is cooperated with a fish trapping operation at Keswick Dam. Since construction, the effectiveness of the hatchery has been affected by a variety of problems, including deterioration of existing facilities, disease, poor water quality, inadequate water supply, inadequate pollution abatement facilities, and insufficient holding and rearing space. The operation of the Keswick fish trap has been impaired by flows that commonly occur during the late-fall and winter chinook salmon runs.

Four plans were proposed by the USFWS to salvage the Sacramento River salmon blocked by Shasta Dam. The plans were analyzed and one plan was recommended for implementation, "The Sacramento River, Battle Creek, Deer Creek Plan." Under the plan, it is anticipated that the fall-run chinook could be held by racks in the main stem Sacramento River to encourage natural spawning. Excess fish would be trapped and taken to the hatchery facilities on Battle Creek. Spring-run chinook would be trapped and transferred to suitable tributaries, such as Deer Creek, for natural spawning, and to Battle Creek for artificial propagation at the Coleman NFH.

To implement the plan Reclamation agreed to construct a fish ladder, trap, and lift at Keswick Dam and at the Balls Ferry rack, construct a hatchery on Battle Creek, construct five racks in Battle Creek to form holding and ripening pools for adult spring salmon, construct three racks across the Sacramento River, and construct a fishway around the lower falls on Deer Creek. These goals were not met and, in 1949, operation of the Coleman NFH was transferred to the Service. Operation of Keswick Dam was transferred to the Service in 1951.

Recently the Service has revised its production and operating objectives for the facilities. The facilities are also old and in need of rehabilitation and replacement. The Coleman Development Plan was drafted in 1987 and approved in 1988. The new program improves the facilities to meet the objectives for disease control, temperature controls, and optimization of production goals. The plan recommends construction or rehabilitation of water supply systems, water treatment facilities, water temperature control facilities, pollution abatement facilities, a feed storage building, and additional pre-release ponds. The Battle Creek fish barrier dam was reconstructed as part of this plan.

23.2.6 Upper Sacramento River Habitat Study (USFWS)

The Upper Sacramento Fisheries and Riparian Habitat Advisory Council was established in 1986 by Senate Bill 1086. The bill called for preparation of a management plan to protect, restore, and enhance the fish and riparian habitat and associated wildlife of the Upper Sacramento River. The Council's findings were prepared by the Resources Agency in a report in 1989. The Upper Sacramento River Fisheries and Riparian Habitat Management Plan presented in the report identified: 1) two action items to protect and restore riparian habitat; and, 2) 20 action items to resolve fishery problems along the main stem of the Sacramento River and its tributaries. Proposals included in the plan range from clean-up of the Iron Mountain Mine near Redding and reconstruction of the Coleman National Fish Hatchery (discussed above) to construction of fish ladders and screens on tributary streams. Collectively, the 20 fishery action items are called the Fisheries Restoration Plan.

The full Management Plan identified the following potential conflicts involving the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating.

Two action items are identified to protect/restore riparian habitat and twenty items are identified to resolve fisheries problems along the main stem of the Sacramento River and its tributaries. While actual impacts of these action items are not included in the document, "potential conflicts" associated with action items were identified.

Restoring water level elevations in association with the Glenn-Colusa Irrigation District Diversion (Environmental Assessment is first document on this list) is a component of this plan. Accordingly, all impacts attributable to restoring water elevation at the Glenn-Colusa Irrigation District Diversion would occur if this part of the plan were to be implemented.

The potential project-related impacts to aquatic biological resources were identified, as follows: 1) increased hatchery production of salmon/steelhead may depress natural stocks; and 2)

increased natural spawning in Battle Creek may interfere with the operation of the Coleman National Fish Hatchery.

The potential project-related impacts to water quality and circulation were identified, as follows: 1) potentially exacerbate existing seepage problems affecting landowners along the Sacramento River; and 2) potentially create drawdown of groundwater.

No potential impacts to recreational boating or terrestrial RTE species were identified.

23.2.7 American River Watershed Investigation (Corps)

This study addresses flooding and flood control problems in the American River Basin. The study focuses on the levees near the Natomas area of Sacramento, Folsom Dam and the downstream levees, and the reach of the river above Folsom Dam near the city of Auburn where flood storage could be added (i.e., the proposed Auburn Dam site). Flood control alternatives include increased storage, raising levees, provide detention basins, constructing Auburn Dam, and improving levee stability along the American River. A preliminary report, EIS and feasibility study were completed in 1991. In March 1996, a Supplemental Information Report was finalized.

The 1991 Final EIR/EIS identified the following long-term, or post-construction, project-related environmental effects upon the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating. It is important to note that the potential impacts were identified as indirect, the result of growth induced by the project.

The potential indirect project-related impacts to aquatic and terrestrial biological resources were identified, as follows: 1) development in Natomas would result in a loss of riparian and wetland habitat bordering existing drainage canals and could threaten important riparian and wetland habitat along Fisherman's Lake; 2) development in Natomas would result in losses of 7,280 acres including seasonal wetland habitat provided by rice fields; 3) development-related increases in urban stormwater runoff would adversely affect fisheries occupying affected regional and local waterways; 4) development in Natomas could result in a loss of nesting habitat for the Swainson's hawk; 5) development in Natomas and Meadowview would result in losses of agricultural and open space areas providing Swainson's hawk foraging habitat; and 6) development in Natomas would result in losses of riparian habitat that supports the Valley elderberry longhorn beetle.

In Natomas, the project could result in the following indirect impacts to aquatic and terrestrial biological resources: 1) changes in water quality during construction could temporarily lower fish habitat quality. Operation of the pump facility during flood events could impede fish migration (including chinook salmon, steelhead) and/or trap fish; 2) loss of 18 acres of wetland habitat and 272 acres of upland habitat; 3) effects to sensitive and T/E species include: the Swainson's hawk (20 acres of habitat permanently lost and 626 acres temporarily disturbed during construction); and giant garter snake (3,000 liner feet of habitat in the form of a toe drain along Sankey Road to be relocated).

On the upper American River, the project could result in the following indirect impacts to aquatic and terrestrial biological resources: 1) increased sedimentation and sloughing during flood events may impact fish resources. Vegetation and associated wildlife will be impacted by dam construction, relocation of Highway 49 and Ponderosa Way Bridge, and inundation and associated sloughing events (estimated 1,927 acres impacted); 2) effects to T/E species include: the Valley elderberry longhorn beetle (inundation of elderberry shrubs behind flood control dam could destroy beetle habitat); and 3) increased discharges of urban stormwater runoff into local and regional waterways would adversely affect water quality and degrade aquatic resources.

No long-term direct or indirect project-related impacts to recreational boating, water quality or circulation were identified.

23.2.8 Sacramento Metropolitan Area Flood Control Study (Corps)

In February 1986, major storms in California caused significant flooding in the Sacramento area. High water levels were experienced along the Sacramento River and Yolo Bypass. It was determined that the area did not have the 100-year storm flood protection levels that were assumed. Based on information collected from the 1986 flood, it is estimated that about 30,000 people are at risk from flooding in the West Sacramento area.

In response to this storm, the Corps prepared a feasibility report and EIR/EIS for studies of flooding problems along the Sacramento River and Yolo Bypass, from the Sacramento Weir downstream to an area just south of Freeport. This study was not part of the American River Watershed Investigation. The feasibility report identified a Selected Plan to reduce potential flood threat to the West Sacramento area. DWR also participated in the study and EIR/EIS.

From the feasibility studies and EIR/EIS evaluations a Selected Plan was developed. The Selected Plan calls for raising levees around West Sacramento, including the Yolo Bypass and Sacramento Bypass. The Selected Plan also assumes the American River 200-year flood control-only dam is in place. If this dam is not constructed, the Selected Plan would remain feasible, but would provide the West Sacramento area with at least a 150-year level of flood protection.

The feasibility report and EIR/EIS were submitted to Congress for authorization. The basic authority for the study was provided in the Flood Control Act of 1962 (PL 87-874), which directs the Corps to study flood problems in the Sacramento River Basin and other streams in Northern California.

In a separate, but related study, the 1987 Sacramento River Bank Protection Project Final EIR/EIS identified the following long-term, or post-construction, project-related environmental effects upon the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating.

The document presents a number of alternatives methods for bank protection. Alternatives will be chosen on a site by site basis. Impacts associated with the most environmentally damaging alternative (also the preferred alternative for most sites) are presented below.

The potential project-related impacts to water quality and circulation were identified, as follows: 1) small amount of pesticide release from conversion of riparian land to agricultural land (by introduction of pesticide use in the inter-levee environment).

The potential project-related impacts to aquatic and terrestrial biological resources were identified, as follows: 1) direct loss of woody riparian habitat near banks. Construction, operations, and maintenance clearing losses on bank, berm, and possibly levees; 2) complete loss of shaded aquatic habitat (SRA habitat) where present; 3) removal of two known populations and any undiscovered populations of special status species than may be present. Species potentially impacted include the Suisun Marsh aster, rose-mallow, Mason's lilaeopsis, and Delta tule pea; 4) Swainson's hawk nesting habitat lost where trees over forty feet high in construction and/or operations/maintenance clearing zones; 5) Yellow-billed cuckoo habitat lost where cottonwood-willow stands of at least 25 acres and 300 feet wide extend into near bank areas or clearing areas; 6) loss of bank swallow nesting colony (if present), or loss of suitable habitat if unvegetated, vertical, fine sandy-loam north-to-east facing banks are present; 7) loss of valley elderberry longhorn beetle habitat where elderberry shrubs are near bank or in clearing zones; and 8) negative impacts upon fish include: complete loss shading canopy and instream nearshore cover; creation of unfavorable flow conditions; and probably diminish juvenile chinook salmon numbers due to losses in rearing habitat.

No potential project-related impacts to recreational boating were identified.

23.2.9 Los Banos Grandes Dam And Reservoir Study (DWR)

The Los Banos Grandes facilities would consist of an offstream 1.73 million acre-foot storage reservoir, located near the San Luis Dam and Reservoir, with associated pumping and generating plants and conveyance channels. The concept is to bank water south of the Delta when winter flows are high. These flows would be pumped from Banks Pumping Plant in the Delta through the California Aqueduct to the existing San Luis Reservoir and pumped to the proposed Los Banos Grandes Reservoir for storage. Power would be generated when the water is released from Los Banos Grandes Reservoir into the San Luis Reservoir and when water is released from the San Luis Reservoir to the California Aqueduct. The operation of the proposed reservoir would be similar to that of San Luis Reservoir, except that Los Banos Grandes Reservoir would reserve about two-thirds of its stored water each year to provide for supplies during periods of water shortage. The project would improve the reliability of the SWP by increasing the dependable yield of the project by over 250,000 af. This estimate in the increased yield was made prior to the establishment of Delta export restrictions defined by the biological opinions for winter-run chinook salmon and Delta smelt.

Two other potential reservoir sites evaluated for the Los Banos Grandes project are the Orestimba Reservoir and Sunflower Reservoir. The Orestimba Reservoir was to be located on Orestimba Creek west of the town of Newman. The reservoir was proposed as an alternative to Los Banos Grandes and would provide 620,000 af of storage with an average annual yield of 105,000 af. The reservoir was proposed for construction in combination with Sunflower or Kellogg Reservoirs and a Marsh Creek/Orestimba Reservoir. The alternative was removed from further consideration because the Contra Costa Water District began the planning and design of a

Kellogg/Los Vaqueros Reservoir project. Sunflower Reservoir was to be located near the confluence of the Coastal Aqueduct and California Aqueduct. This Reservoir also was proposed as an alternative to Los Banos Grandes and would provide 600,000 af of storage with an annual average yield of 80,000 af. The reservoir was proposed for construction in combination with Los Vaqueros Reservoir, a Marsh Creek or Orestimba Creek reservoir, or Upper Garzas, Ortigalita, Del Puerto, and/or Orestimba Reservoirs. This alternative was removed from further consideration because of the high evaporative losses that would be experienced at the Sunflower site and because the Sunflower site has several active oil production wells within the watershed. Before water could be safely stored at the Sunflower site, all active and previously abandoned oil production wells would have to be sealed.

A Draft EIR for the Los Banos Grandes Facilities was released in December 1990. Due to changes in environmental regulations and water supply conditions, the feasibility of constructing the facility is being reevaluated along with all potential south-of-the-Delta offshore reservoir sites..

The 1990 Draft EIR identified the following long-term, or post-construction, project-related environmental effects upon the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating. The impacts upon aquatic biological resources include a shift in timing of exports that will have a minor environmental impact during winter and high-flow periods; improved water conditions in the Delta during critical periods for striped bass; and a minor impact upon Sacramento River winter-run salmon.

The impacts upon water quality and circulation include: improvements in quality of winter releases to downstream Los Banos Creek, potential rise in water table and increased agricultural drainage problems, and movement of selenium.

The impacts to terrestrial RTE species include the loss of plant and wildlife habitat including sensitive species and wetlands.

No impacts to recreational boating were identified in the Draft EIR.

23.2.10 Monterey Agreement (DWR)

Significantly different conditions and circumstances that exist today have prompted agricultural, municipal and industrial contractors of the SWP to consider amendments to their water supply contracts with the Department of Water Resources. Negotiations ensued between the Department of Water Resources and the State Water Project contractors, which led to a set of principles known as the Monterey Agreement signed in December of 1994. The approved Statement of Principles contains the foundation for an agreement between the SWP contractors and DWR that will change the way water allocations are made and change certain operational aspects of the SWP.

The major changes in the operation of the SWP include: (1) water allocations will be based on contractual entitlements; (2) agricultural and urban contractors will receive equal treatment when

water shortages occur; (3) the Kern Fan Element of the Kern Water Bank, a ground water storage facility, will be turned over to agricultural contractors in exchange for the permanent retirement of 45,000 acre-feet of water entitlements; (4) agricultural contractors have agreed to the permanent sale of 130,000 acre-feet of annual entitlements to urban contractors; (5) stored water and capacities at Perris and Castaic reservoirs can be used by contractors to more efficiently manage local water supplies; (6) contractors may transport non-SWP water through project facilities and store water outside their service areas until needed; (7) contractors can take delivery of available uncontrolled flows in proportion to their entitlements for the year, when the Department determines such supplies exist; (8) rate management for both agricultural and urban contractors and the ability to manage funds for more stable rates; (9) provides a mechanism for contractors to "turn back" unneeded entitlement water annually that DWR can then market to other contractors; (10) funding will be provided for two facilities: a corporation yard in West Sacramento and a permanent water operations center in Sacramento.

23.2.11 Suisun Marsh Protection Plan (DWR)

In 1977, the "Suisun Marsh Protection Plan" was implemented by the Bay Conservation and Development Commission and Department of Fish and Game (DFG) to protect the marsh. With the adoption of Decision 1485, DWR and Reclamation recognized the need to develop the "Initial Facilities" -- Roaring River Slough Distribution System, Morrow Island Distribution System and Goodyear Slough Outfall in 1980 to achieve internal marsh standards and provide wetland managers with lower salinity water.

In 1984, DWR, working with Reclamation, DFG and Suisun Resource Conservation District, prepared the document entitled "Plan of Protection for the Suisun Marsh including Environmental Impact Report" to mitigate impacts on the Marsh created by the CVP, SWP and other upstream water users. The facilities described in the Plan of Protection are built in stages with testing periods included in the construction schedule. The testing periods are used to determine whether the required standards can be met after each phase of facility construction. In 1987, the signing of the Suisun Marsh Preservation Agreement implemented the Plan of Protection objectives. Therefore, the Suisun Marsh Salinity Control Gates located at Montezuma Slough were completed in 1988. The testing periods in 1988-90 indicated that the control gates performed better than expected from Collinsville toward Grizzly Bay. The measured channel water salinities in the eastern Marsh were lower than previously recorded. However, a western Marsh station indicated that additional facilities may be needed to maintain channel water salinities in the western Marsh.

The "Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary" (May 1995) and DWR's estimate of resulting salinity conditions in the Suisun Marsh given in "Estimate of Salinity Changes in Suisun Marsh For Water Years 1987-92 With CUWA/AG Criteria" indicated that it is unlikely that additional large scale facilities will be necessary for salinity control in the Suisun Marsh. Consequently, USBR and DWR halted work on the draft EIR/EIS for the Western Suisun Marsh Salinity Control Project in March 1995.

The 1995 WQCP also prompted DWR to convene the Suisun Ecological Work Group (SEW) to evaluate the basis for western Marsh standards and recommend new standards. SEW will complete its work in 1997.

In August 1995, an ad hoc negotiating team and a technical support team were established to facilitate discussions directed at updating the 1987 Suisun Marsh Preservation Agreement. The amendment process should be completed by August 1997 when SWRCB is scheduled to review western Suisun Marsh water quality objectives and water rights issues.

The 1984 Final Environmental Impact Report (EIR) identified the following long-term, or post-construction, project-related environmental effects upon the target resources: aquatic biological resources; water quality and circulation; terrestrial RTE species; and recreational boating.

The potential project-related impacts to water quality and circulation identified include reduction of salinity within Suisun Marsh and increased net velocities within most marsh channels.

The potential project-related impacts to aquatic and terrestrial biological resources were identified, as follows: 1) conversion of up to 437 acres of marshland habitat to open water (in channels and ponds) and upland habitat (on new levees) and conversion of 96 acres of upland vegetation to water surface; 2) loss of marsh habitat would adversely affect the endangered salt marsh harvest mouse and potential habitat of the endangered California clapper rail and threatened California black rail; 3) delay migration of chinook salmon, steelhead, American shad, sturgeon, and striped bass. Juvenile fish would potentially be exposed to greater predation during delays near structures; 4) increases in water velocities may lower densities of prey species such as *Neomysis* in eastern Montezuma Slough and decrease the forage base for fish (especially juvenile striped bass); and 5) length and location of the interface between saline and brackish water in the marsh channels would be altered at times and potentially affect fish food resources.

The potential project-related impacts to recreational boating identified were that boat traffic in Montezuma Slough could be delayed near the control structure (up to thirty minutes if a large number of boats needed to pass through the lock) during portions of those years when maintaining Marsh water quality requires operation of the structure.

23.2.12 West Delta Program (DWR)

The objective of the West Delta Program is to implement a land-use management program for effectively controlling subsidence and soil erosion on Sherman and Twitchell Islands while also providing habitat for wildlife and waterfowl. DWR and DFG have jointly developed the wildlife management plan for the two islands. That plan is also designed to benefit species of wildlife that occupy wetland, upland, and riparian habitats and provide recreational opportunities for hunting and viewing. In addition, property acquired and habitat developed through DWR's effort will be available for use as mitigation for impacts associated with DWR's ongoing Delta water management programs.

As a result of implementing the wildlife management plan, subsidence would be significantly reduced through minimizing oxidation and erosion of the peat soils on the islands. Minimizing oxidation and erosion would be accomplished by replacing present agricultural practices with land-use management practices designed to stabilize the soil. Those practices range from minimizing tillage to establishing wetland habitats. Altering land-use practices could result in up to 13,600 acres of managed wildlife and waterfowl habitat; increased flood control; additional protection of water quality in the Delta; increased reliability of SWP's water supply; and additional recreational opportunities in the Delta. Also, establishing wetland and wildlife habitats on the two islands is consistent with national and state policies designed to enhance and expand wetlands.

23.2.13 CALFED Bay-Delta Program (State And Federal Agencies)

California and the federal government are working together to stabilize, protect, restore, and enhance the San Francisco Bay / Sacramento-San Joaquin Delta Estuary. The cooperation was formalized in June 1994 with the signing of a Framework Agreement and the CALFED Bay-Delta Program was established in 1995. The participating agencies include: California Resources Agency; Department of Water Resources; Department of Fish and Game; California Environmental Protection Agency; State Water Resources Control Board; U.S. Department of Interior; U.S. Bureau of Reclamation; U.S. Fish and Wildlife Service; U.S. Environmental Protection Agency; and National Marine Fisheries Service. These agencies have management and regulatory responsibility in the Bay-Delta Estuary and are working together as CALFED.

The Framework Agreement pledged that State and federal agencies would work together in three areas of Bay-Delta management: (1) formulation of water quality standards; (2) coordination of State Water Project and Central Valley Project operations with regulatory requirements; and (3) development of long-term solutions to problems in the Bay-Delta Estuary.

Significant progress has been made in all three areas, including: the December 15 Accord; regular meetings of the "Operations Group," which consists of representatives of the SWP, CVP and CALFED, to provide oversight of project operations; and the chartering of the Bay-Delta Advisory Council, which will advise CALFED on the program mission, problems to be addressed, and objectives for the CALFED Bay-Delta Program.

The CALFED Bay-Delta Program is a joint state-federal effort to develop long-term solutions to problems of the Sacramento/San Joaquin Bay-Delta system. The solution finding effort focuses on ecosystem quality, water supply reliability, water quality, and vulnerability of Delta levees and channels to natural disasters. The three phase program is currently in the first phase of planning: developing alternatives. The second phase will include development of a Program EIR/EIS, reconnaissance level analysis, and pre-feasibility-level planning effort to identify on preferred solution alternative. The final phase (scheduled to begin in mid 1998) will be a site-specific environmental review of individual components of the preferred alternative selected at the end of the Phase II analysis (Project Specific EIR/EIS). The final phase is expected to continue for several years.

The CALFED Bay-Delta Program and the Interim South Delta Program are independent programs striving for solutions to the complex problems of the Delta and they can be complementary. ISDP will provide permanent solutions that can be reasonably implemented in a five to seven year time frame. These solutions address agriculture, fisheries, and water supply needs in the Delta. The proposed south Delta barriers will provide increased water levels and improved circulation and the new intake and dredging will provide added operational flexibility for the SWP. Both of these components could complement a long term solution to the problems of the Delta.

23.2.14 Bay-Delta Proceedings (State Water Resources Control Board)

Hearings to adopt a water quality control plan and water rights decision for the Bay-Delta Estuary began in July 1987. Their purpose was to develop a San Francisco Bay/Sacramento-San Joaquin Delta water quality control plan and to consider public interest issues related to Delta water rights, including implementation of water quality objectives. During the first phase of the proceedings, State and federal agencies, including DWR, public interest groups, and agricultural and urban water purveyors, provided many expert witnesses to testify on various issues pertaining to the reasonable and beneficial uses of the estuary's water. This phase, which took place over six months, generated volumes of transcripts and exhibits.

The SWRCB released a draft Water Quality Control Plan for Salinity and Pollutant Policy Document in November 1988. However, the draft water quality control plan, a significant departure from the 1978 plan, generated considerable controversy throughout the State. The Pollutant Policy Document was subsequently adopted in June 1990.

In January 1989, the SWRCB decided to significantly amend the draft plan and redesign the hearing process. The water quality phase would continue, an additional scoping phase would follow, and issues related to flow would be addressed in the final water rights phase. Concurrently, DWR and other agencies offered to hold a series of workshops to address the technical concerns raised by the draft plan. These workshops were open to the public and benefited all parties involved by facilitating a thorough discussion of technical issues. After many workshops and revisions to the water quality control plan, the SWRCB adopted a federal plan in May 1991. The federal EPA rejected this plan in September 1991.

With the adoption of the Water Quality Control Plan, the SWRCB began the EIR scoping phase and held several workshops during 1991 to receive testimony about planning activities, facilities development, negotiated settlements, and flow objectives. The goal was to adopt an EIR and a water right decision by the end of 1992.

In response to the Governor's April 1992 water policy statement, the SWRCB decided to proceed with a process to establish interim Bay-Delta standards to provide immediate protection of fish and wildlife. Water right hearings were conducted from July through August 1992, and draft interim standards (proposed Water Right Decision 1630) were released for public review in December 1992. Concurrently, under the broad authority of the Endangered Species Act, the federal regulators were developing Delta standards and upstream measures applicable to the CVP and SWP for protection of the threatened winter-run chinook salmon. In February 1993, NMFS issued a long-term biological opinion governing operations of the CVP and SWP. The opinion

set Delta environmental regulations, in certain months, more restrictive than the SWRCB's proposed measures. On March 1, 1993, USFWS officially listed the delta smelt as a threatened species and shortly thereafter indicated that further restrictions of CVP and SWP operations would be required.

In April 1993, the Governor asked the SWRCB to withdraw its proposed Decision 1630 and, instead, to focus efforts on establishing permanent standards for protection of the Delta, since recent federal actions had effectively preempted State interim standards and provided interim protection for the Bay-Delta environment. On December 15, 1993, EPA announced its proposed standards for the estuary in place of SWRCB water quality standards EPA had rejected in 1991; USFWS proposed to list the Sacramento splittail as a threatened species; and NMFS announced its decision to change the status of winter-run salmon from threatened to endangered.

In April 1994, the SWRCB began a series of workshops to review Delta protection standards adopted in its 1991 Water Quality Control Plan for Salinity and to examine proposed federal EPA standards issued in December 1993. These processes involved both the SWRCB and EPA and were intended to establish a mutually acceptable draft SWRCB Delta regulatory plan scheduled for release in late 1994.

On December 15, 1994, federal and State officials announced agreement on a protection plan for the Bay-Delta Estuary. These Principles for Agreement are intended to be effective for three years. At the same time, the SWRCB completed and issued a draft Water Quality Control Plan consistent with the December 15, 1994, State-federal agreement. The SWRCB subsequently released a draft Environmental Impact Report (EIR) documenting the SWRCB's analysis of the needs for and the effects of implementing the draft plan. The SWRCB conducted a public hearing on February 23, 1995, to receive comments on the draft Plan and EIR. After considering all comments, the SWRCB revised the draft Plan and conducted a public meeting on May 22, 1995, where the board adopted the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

On February 28, 1995, the Reclamation and DWR filed a petition with the SWRCB for changes in their water rights to conform with the Principles of Agreement and adopted WQCP. The petition clarifies the authorization for the Reclamation and DWR to divert or redivert water from each other's points of diversion in the southern Delta. The SWRCB announced a public hearing to receive evidence to assist the Board in determining whether to approve the petition. After reviewing the evidence, the SWRCB conducted a public adoption meeting on June 8, 1995, when Order WR 95-6 was adopted by the Board. This order temporarily conforms terms and conditions of the Reclamation and DWR water rights to reflect the 1995 Bay-Delta Plan and provides for joint points of diversion under certain restricted circumstances.

The adoption of the 1995 Water Quality Control Plan for San Francisco Bay/Sacramento-San Joaquin Delta Estuary on May 22, 1995, necessitates another water right decision to implement the objectives in the Plan. On July 27, 1995, the SWRCB announced that it was convening a series of workshops to seek comments and recommendations on a process to develop a water right decision which will implement the Plan. The water right decision will follow an inclusive water right proceeding. During that proceeding, the SWRCB will allocate responsibility for meeting the water quality objectives in the 1995 Bay-Delta Plan among the water right holders

who divert water from the tributaries of the Bay-Delta Estuary. The water right proceeding has commenced preparation of an Environmental Impact Report, which may not be completed until late 1998. The three-year process consists of an EIR scoping process, a draft EIR, and hearings on water rights for the preferred alternative. In the interim, the CVP and SWP have agreed to meet standards in Order WR95-6 for the next three years.

23.2.15 Delta Wetlands Project (Delta Wetlands Corporation)

The purpose of the Delta Wetlands Project is to divert surplus Delta inflows, transferred water, or banked water for: 1) later sales, 2) release for Delta export, or use in meeting water quality or flow requirements for the San Francisco Bay/ Sacramento San Joaquin Delta Estuary. The project, proposed by Delta Wetlands Corporation, would provide seasonal storage of unappropriated water on two islands in the Delta: Webb Tract and Bacon Island. Bouldin Island and 3,014 acres of Holland tract will be devoted to wildlife benefits, with only minor water development. Water would be diverted onto the islands using several existing siphons and two new siphons on each island. New diversions would be screened to protect fish. The stored water would be pumped from the islands and rediverted for other uses, including purchase for irrigation, domestic, municipal, fish and wildlife enhancement, or water quality protection purposes. A draft EIR/EIS was distributed in 1990. The revised draft was released September 1995.

The 1995 draft EIR/EIS identified long-term, or post-construction, project-related environmental effects upon the following target resources: water quality and circulation; aquatic and terrestrial biological resources; and recreational boating.

The potential project-related impacts to water quality and circulation were identified as follows: (1) channel flows; (2) significant salinity increases at Chipps Island, Emmaton, Jersey Point, and in Delta exports during periods of low Delta outflow; (3) significant elevation of dissolved organic carbon concentrations in Delta exports and elevation of trihalomethane concentrations in treated drinking water; (4) significant changes in temperature, suspended solids, dissolved oxygen and chlorophyll in Delta channel receiving waters; (5) potential contamination of stored water by pollutant residues.

The potential project-related impacts to aquatic and terrestrial biological resources were identified as follows: (1) chinook salmon mortality could increase; (2) increased entrainment loss, which could reduce the survival of striped bass eggs and larvae, delta smelt larvae, and possibly longfin smelt larvae; (3) loss of jurisdictional wetlands on reservoir islands, including riparian, marsh, and pond habitats; (4) increased incidence of waterfowl disease; (5) losses of upland habitats, foraging habitats for wintering waterfowl, habitats for upland game species, foraging habitats for greater sandhill crane and Swainson's hawk and nesting habitats for northern harrier.

The potential project-related impacts to recreational boating were identified, as follows: (1) decreased quality of the recreation experience for boaters and anglers; (2) significant and unavoidable impacts in vehicle boat traffic; (3) increased safety problems on Delta waterways.

23.2.16 *Los Vaqueros Project (Contra Costa Water District)*

The Los Vaqueros Project is currently under construction by the Contra Costa Water District (CCWD). The project will improve the quality of water supplied to customers, minimize seasonal quality changes and improve the reliability of the water supply. Construction began in 1994 and should begin operation in late 1996 or early 1997. The project is a 100,000 acre-foot reservoir within the Kellogg Creek watershed. Also included in the project is a new supplemental Delta intake, located approximately 1,000 feet south of State Route 4 along Old River; conveyance pipelines; transfer reservoir; pumping plants; and other facilities necessary for project operation. Water diverted from the new Delta intake will be pumped to the Los Vaqueros Reservoir site when surplus water of adequate quality is available in the Delta between November 1 and June 30. In late summer, when Delta water quality deteriorates, reservoir water will be released and blended with Delta water from direct diversions or used directly, without blending, to reduce salinity. The water will be delivered to the existing Contra Costa Canal system and to the Randall-Bold Water Treatment Plant for use within CCWD's service area.

The potential project-related impacts to aquatic and terrestrial biological resources were identified as follows: (1) disturbance or removal of resident fish habitat; (2) reduced survival of chinook salmon, striped bass eggs/larvae, delta smelt larvae and small juveniles; (3) increased entrainment of chinook salmon (all runs); (4) potential loss or degradation of significant plant communities, including jurisdictional wetlands, communities in other waters of the U.S., and special-status plant species; (5) potential secondary impacts to 33 acres of alkali wetland communities and potential loss of between 13.2 and 41.7 acres of alkali wetlands; (6) loss of willow cottonwood riparian woodland and mixed riparian woodland; (7) loss of approximately 180 acres of valley oak riparian woodland; (8) loss or fragmentation of up to three populations of brittlescale and spearscale; (9) elimination of 5.3 acres of Kellogg and Brushy Creeks and their associated riparian and upland vegetation; (10) loss of aquatic wildlife species downstream of dam site; (11) loss of between 856 and 866 acres of occupied kit fox habitat and 15 acres of potential habitat; (12) elimination or partial loss of populations of California red-legged frogs and western pond turtles; (13) potential loss of tiger salamander; (14) reduction of special-status amphibians and reptiles; and (15) potential loss of fairy shrimp.

The potential project-related impacts to water quality and circulation were identified as follows: (1) small changes in circulation patterns due to new intake at Old River near Highway 4; and (2) projected increases in salinities at Rock Slough approximately 34 percent of the time.

No potential project-related impacts to recreation.

23.3 *Comparative Evaluation*

The following is a comparative analysis which identifies the resources potentially affected by ISDP that appear to be potentially impacted by other water development projects and programs identified above. It should be noted that comparable environmental information was not available for several projects, including the Auburn Dam (BR), Coleman Fish Hatchery (FWS), Monterey Agreement, CALFED Bay-Delta Program, and Bay-Delta Proceedings. These projects were considered based upon a general familiarity with the project areas and the kinds of effects

the projects might have on the environment. The remaining 12 projects, along with ISDP, were considered within a matrix format, showing the project names and the range of specific and general effects (Figure 23-1). These effects were recorded verbatim from the individual environmental assessment documents, combining some closely related effects where appropriate. The focus of our evaluation was upon aquatic and terrestrial biological resources, water quality and circulation, and recreational boating, which are the key issues for ISDP. Growth-inducement was considered as well as an indicator of the potential for significant indirect cumulative impacts. The 16 areas of impact identified in the matrix are those areas adversely affected by ISDP and by at least two other projects.

A comparison of the 12 projects discussed and the 16 areas of impact leads to a number of conclusions. First, 69 percent of the listed projects would adversely impact winter run chinook salmon; 54 percent would adversely impact riparian vegetation; 46 percent would adversely affect wetlands; and 38 percent of the projects would adversely affect Delta smelt and would create sedimentation impacts. Three projects stand out as having many of the same potential adverse impacts as ISDP: 1) the Los Banos Grandes Reservoir Project would potentially affect 11 of the 16 impact areas listed for ISDP (69 percent); 2) the Delta Wetlands Project would potentially impact 10 of the listed areas (63 percent); and 3) the Glenn Colusa Irrigation District Fish Facility would potentially impact seven of the listed areas (44 percent).

The potential project-related cumulative effects upon these resources are being addressed by a number of entities through the initiation of actions and programs specifically designed to improve the habitat conditions for fish and wildlife resources residing in or migrating through the Sacramento-San Joaquin Delta. These measures are designed to balance the potential effects of existing and future cumulative actions in the Delta, including water resources actions, with appropriate environmental protection efforts for fish and wildlife resources residing in or migrating through the Delta. These measures include the following:

Central Valley Project Improvement Act

Formation of the Federal/State Bay-Delta Advisory Council

The December 15, 1994 Accord on Bay-Delta Standards

The SWRCB 1995 Water Quality Control Plan

Listing of Sacramento River winter-run salmon and Delta smelt under the Endangered Species Act

Formation of the Delta Protection Commission

The San Joaquin River Management Plan

Sacramento River 1086 Plan

EPAs Comprehensive Conservation Management Plan for the Bay-Delta Estuary

Stone Lake Refuge

Consumnes River Preserve

Levee Maintenance for No Long-Term Loss of Habitat

Striped Bass Recovery Plan

Native Fisheries Recovery Plan

Anadromous Fish Restoration Program

Interagency Ecological Program

North American Waterfowl-Pacific Flyway Coordination

The following is a concluding subsection on overall cumulative impacts and trends.

23.4 Cumulative Impacts and Trends

Our comparative evaluation identified resources that would be directly affected by at least three proposed water-related development projects, including ISDP. In addition, there may be indirect growth-inducing effects upon many of the resources on the list. This would occur through population growth and associated development of housing and infrastructure; or, through the removal of obstacles to the construction of projects that have these effects. Projects that affect all of the listed resources, *and* would potentially create significant growth-inducing impacts would likely have a greater potential for creating significant adverse cumulative impacts. These would include south of the Delta water storage projects, which would have a relatively large capacity to directly affect the Delta resources and indirectly affect the resources of the central and southern California service areas.

In considering the list of 16 affected resources and issue-areas in Figure 23-1, this EIR/EIS concluded that ISDP would have a significant unavoidable adverse impacts on navigation and THM formation potential. Accordingly, ISDP would also be considered to have a significant adverse cumulative impact upon these resources.

ISDP would have potentially significant adverse impacts upon 15 of the other affected resources and issue-areas, and less-than-significant adverse impacts within one issue-area, growth inducement. The resources potentially significant adverse impacts are: riparian vegetation, wetlands, aquatic invertebrate habitat, Delta smelt, winter-run Chinook Salmon, Swainson's hawk habitat, Sacramento splittail, Striped bass, American shad, San Joaquin kit fox, Delta tule pea, Mason's lilaeopsis, and fish migration. Having been identified as potentially significant, mitigation measures and avoidance strategies have been proposed that would alleviate the impacts, in several cases reducing the potential impacts to the level of no effect. In considering that these resources, a total of 15 of the list of 16, appear to be under development pressure by other water-related projects, we conclude ISDP would potentially have significant adverse cumulative impacts upon these several resources. These potential significant adverse impacts are alleviated to an unknown extent by the numerous habitat improvement actions and programs being undertaken within the Delta area.

Figure 23-1. Cumulative Impacts Matrix

Area of Impact	ISDP	Los Banos Grandes	Delta Wetlands	Glenn Colusa Irrigation District	American River Watershed Investigation	Sacto Metro Area Flood Control Study	Los Vaqueros	Kern Water Bank	Susun Marsh Protection Plan	San Luis Drain	Upper Sacramento River Habitat Study	Kesterson Reservoir Cleanup	West Delta Program	No. of Projects with Impacts
Chinook Salmon	X	X	X	X		X	X	X		X	X			9
Wetlands/Shallow Water Habitat	X	X	X	X	X		X					X		6
Delta Smelt	X	X	X				X			X				5
Sacramento Splittail	X	X									X			3
Striped Bass	X	X	X						X					4
American Shad	X	X							X					3
Fish Migration, Straying, and Transport	X		X	X	X									4
Riparian Vegetation	X	X	X	X	X	X	X							7
Swainson's Hawk Habitat	X			X	X	X								4
San Joaquin Kit Fox	X	X	X				X							4
Delta Tule Pea	X		X			X								3
Mason's Lilaeopsis	X		X					X						3
Sedimentation	X	X	X	X	X									5
THMFP Increases in Export Water	X	X											X	3
Navigation	X			X					X					3
Growth Inducement	X	X			X									3
No. of Impacts Shared with ISDP	16	11	10	7	6	4	5	2	3	2	2	1	1	

As presented in Chapter 22 of this EIR/EIS, ISDP would not facilitate significant population growth in the central and southern California services areas. The identified potential significant effects of ISDP are limited to the Delta and vicinity. This tends to alleviate the potential for substantial effects upon a number of the listed resources and issue-areas, when ISDP is compared to the larger, more growth-inducing projects, and improves the likelihood that the adverse impacts of ISDP are accurately identified and appropriately categorized in this EIR/EIS as less-than-significant or mitigated to a level of being less-than-significant. Accordingly, this EIR/EIS concludes ISDP would have a potentially significant cumulative impact upon Chinook salmon, Delta smelt, Sacramento splittail, striped bass, American shad, navigation, and fish migration, straying, and transport, but would have less-than-significant cumulative impacts upon the other listed resources and issue-areas.